

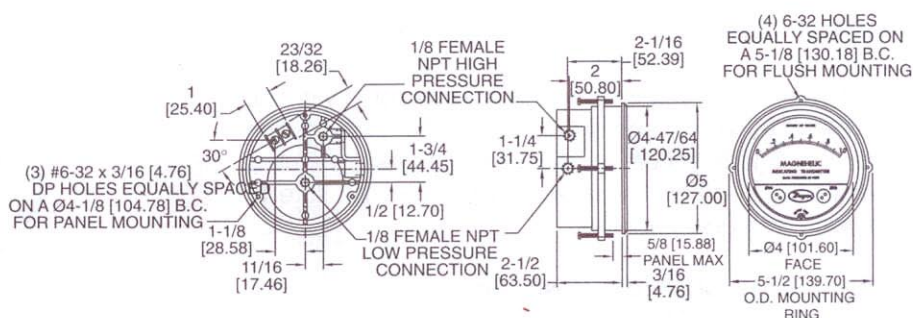


Series 605 Magnehelic® Differential Pressure Indicating Transmitter

Specifications - Installation and Operating Instructions



Patent No. 4,890,497



The Dwyer Series 605 Magnehelic® Indicating Transmitter simultaneously provides local indication on a large, easily read analog scale while also converting that pressure into a standard two-wire, 4-20 mA signal for ranges from 0-0.5 to 0-50" w.c. Positive, negative or differential air and compatible gas pressure can be measured with an accuracy of $\pm 2\%$ of full scale. The basic mechanical components of the Series 605 Magnehelic® indicating transmitter are similar to those used in the popular, time-proven Magnehelic® differential pressure gage. However, the Series 605 models add electrical conditioning and amplification of a resistance change produced by a silicon strain gage which is cemented to the range spring. This resistance change is the result of the slight flexing which results from spring deflection as pressure is applied to the diaphragm which is directly linked to the spring.

STANDARD ACCESSORIES

Mounting ring
Snap ring
(4) 6-32 x 1-1/4 screws (panel mtg.)
(3) 6-32 x 5/16 screws (surface mtg.)
(2) Tubing to 1/8" NPT adapters
(2) 1/8" NPT plugs
Adjustment key

SPECIFICATIONS

GAGE SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Accuracy: See chart.
Stability: $\pm 1\%$ F.S./yr.
Pressure Limits: See chart.
Temperature Limits: 20 to 120°F (-6.67 to 48.9°C).
Process Connections: 1/8" female NPT.
Size: 4" (101.6 mm) dial face, 5" (127 mm) O.D. x 2-1/16" (68.3 mm).
Weight: 1 lb, 12.6 oz (811 g).
Agency Approvals: CE.

TRANSMITTER SPECIFICATIONS

Accuracy: See chart (includes linearity, hysteresis, repeatability).
Temperature Limits: 20 to 120°F (-6.67 to 48.9°C).
Compensated Temperature Range: 32 to 120°F (0 to 48.9°C).
Thermal Effect: $\pm 0.025\%$ F.S./°F (0.045% F.S./°C).
Power Requirements: 10-35 VDC (2-wire).
Output Signal: 4 to 20 mA.
Zero and Span Adjustments: Protected potentiometers.
Loop Resistance: DC; 0-1250 ohms maximum.
Current Consumption: DC; 38 mA maximum.
Electrical Connections: Screw terminal block.
Mounting Orientation: Diaphragm in vertical position.
Consult factory for other position orientations.

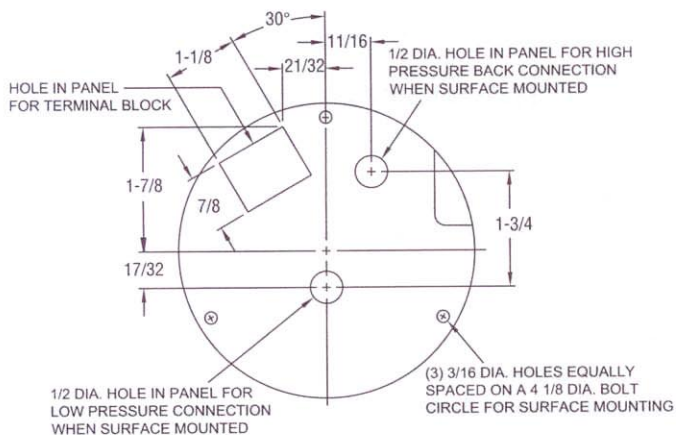
Model Number	Range in w.c.	Maximum Pressure	Electrical Accuracy +/- %	Mechanical Accuracy +/- %	Model Number	Range in w.c.	Maximum Pressure	Electrical Accuracy +/- %	Mechanical Accuracy +/- %
605-00N	.05-0-.20	25 psi (1.7 bar)	2	4	605-20	0-20.0	20 psi (1.4 bar)	0.5	2
605-11	.25-0-.25	25 psi (1.7 bar)	2	3	605-30	0-30	20 psi (1.4 bar)	0.5	2
605-0	0-.50	25 psi (1.7 bar)	2	3	605-50	0-50	20 psi (1.4 bar)	0.5	2
605-1	0-1.0	25 psi (1.7 bar)	2	2	Range in Pa				
605-2	0-2.0	2 psi (34.5 kPa)	0.5	2	605-60Pa	0-60	25 psi (1.7 bar)	2	4
605-3	0-3.0	2 psi (34.5 kPa)	0.5	2	605-125Pa	0-125	25 psi (1.7 bar)	2	3
605-6	0-6.0	2 psi (34.5 kPa)	0.5	2	605-250Pa	0-250	25 psi (1.7 bar)	2	2
605-10	0-10	5 psi (34.5 kPa)	0.5	2	605-500Pa	0-500	2 psi (34.5 kPa)	0.5	2

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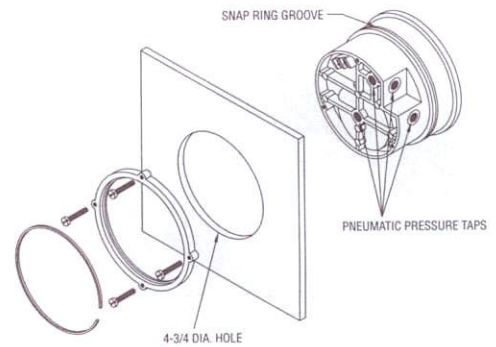
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INSTALLATION

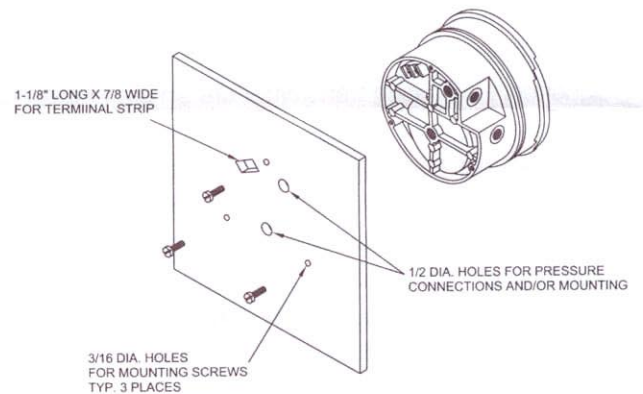
- 1. LOCATION:** Select a location where the temperature of the unit will be between 20°F and 120°F. Distance from the receiver is limited only by total loop resistance. See "Electrical Connections". The tubing feeding pressure to the instrument can be run practically any length required but long lengths will increase response time slightly. Avoid surfaces with excessive vibration.
- 2. POSITION:** All standard models are calibrated with the diaphragm vertical and should be used in that position for maximum accuracy. If your application requires mounting in other than a vertical position, be sure to specify this when ordering.
- 3. PRESSURE CONNECTIONS:** For convenience, two sets of 1/8" female NPT ports are available. Plug the unused set with pipe plugs provided. Attach tubing from positive pressure source to port marked "HI" or from negative (Vacuum) source to port marked "LOW". In either case, opposite port must be vented to atmosphere. In dusty environments, we recommend use of an A-331 Filter Vent Plug to keep interior of instrument clean. For differential pressures the higher source is connected to the "HI" port and lower to the "LOW" port.



- 4. MOUNTING:** The Series 605 Transmitter may be either panel mounted or surface mounted.



- A. PANEL MOUNTING:** Cut a 4-3/4" or 120 mm dia. hole in panel and insert the complete unit from the front. Slip on the mounting ring and install the split snap ring in the groove on the bezel. Seat the mounting ring against the snap ring and thread the four screws through the tapped holes. Tighten screws against rear of panel.



- B. SURFACE MOUNTING:** Drill (3) 3/16" dia. holes for mounting screws and cut (1) 7/8" x 1-1/8" hole for access to terminal strip as shown in hole location drawing. Insert screws from rear of panel and thread into tapped holes on back of transmitter case. If rear pressure connections are to be used, make 1/2" dia. holes located as shown in hole location drawing in left column.

- 5. ZEROING:** Once gage/transmitter is mounted in its final position, check to be sure pointer aligns with zero on scale, when no pressure is applied and both low and high pressure ports are vented to atmosphere. To adjust, turn small slotted screw at center-bottom of gage face. **Do not** move the larger black knobs labeled SPAN and ZERO. These are for use only if a calibration check shows the 4-20 mA output signal to need adjustment. See page 3 under heading OUTPUT RANGING.

ELECTRICAL CONNECTIONS

CAUTION: DO NOT EXCEED SPECIFIED SUPPLY VOLTAGE RATINGS. PERMANENT DAMAGE NOT COVERED BY WARRANTY WILL RESULT. THIS UNIT IS NOT DESIGNED FOR AC VOLTAGE OPERATION.

Electrical connections to the Series 605 Transmitter are made to the two-screw terminal strip on the rear of the case. Polarity is indicated by + and - signs stamped on side. The schematic diagram of the Series 605 transmitter is illustrated in Figure B.

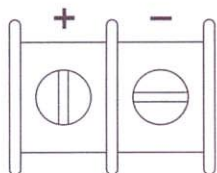


Figure A

An external power supply delivering 10.0 to 35 VDC with a minimum current capability of 40 milliamps must be used to power the control loop in which the Series 605 transmitter is connected. Refer to Fig. B for connection of the power supply, transmitter and receiver. The range of appropriate receiver load resistances (R_L) for the power supply voltage available is given by the formula and graph in Fig. C. Shielded two wire cable is recommended for control loop wiring and the negative side of the loop may be grounded if desired. Note also that the receiver may be connected in either the negative or positive side of the loop, whichever is most convenient. Should polarity of the transmitter or receiver be inadvertently reversed, the loop will not function properly but no damage will be done to the transmitter.

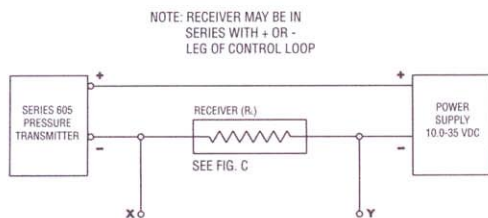


Figure B

The maximum length of connecting wire between the transmitter and the receiver is a function of wire size and receiver resistance. That portion of the total current loop resistance represented by the resistance of the connecting wires themselves should not exceed 10% of the receiver resistance. For extremely long runs (over 1,000 feet), it is desirable to select receivers with higher resistances in order to keep the size and cost of the connecting leads as low as possible. In installations where the connecting run is no more than 100 feet, connecting lead wire as small as No. 22 Ga. can be used.

The Series 605 transmitters can be used with receivers requiring 1-5 volt input rather than 4-20 mA. If the receiver requires a 1-5 volt input, insert a 250 ohm, 1/2 watt resistor

in series with the current loop but in parallel with the receiver input. Referring to Figure B, R_L becomes the 250 ohm resistor and point X and Y are connected to the receiver input, point X being positive (+) and point Y negative (-) or ground. The resistor should be connected at the panel end of the transmitter current loop close to the receiver input to take advantage of the immunity of the current loop to electrical noise pickup. Most electronic component distributors stock a 249 Ω , 1/2 watt, $\pm 1\%$ tolerance metal film resistor which is adequate for this application.

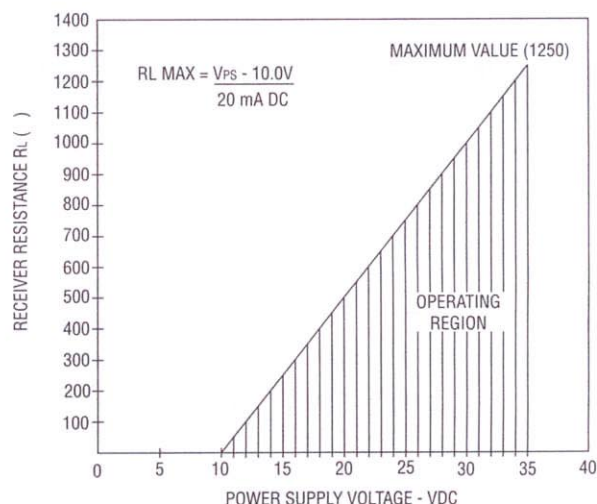


Figure C

OUTPUT RANGING

Each Series 605 Magnehelic® indicating transmitter is factory calibrated to produce 4 mA at zero scale reading and 20 mA at full scale reading. The following procedure should be used if the pressure versus output signal relationship needs to be checked.

1. With unit connected to the companion receiver per preceding instructions, insert an accurate milliammeter with a full scale reading of approximately 30 mA in series with the current loop.
2. Vent both pressure ports to atmosphere and, if necessary, adjust pointer zero screw to align pointer with zero on scale. A controllable pressure source capable of reaching the full scale range should be connected to either high pressure port. Plug the other high pressure port and vent one or both low pressure ports to atmosphere. The instrument must be ranged in the same position in which it will be used. Standard factory calibration and ranging is done with unit vertical.
3. Apply electrical power to the system and check for proper operation by slowly increasing pressure and observing whether the loop current increases above the 4 mA zero pressure reading.
4. A spanner type key is supplied to adjust span and zero. This helps to reduce unauthorized tampering. Apply pressure until pointer aligns with full scale reading and adjust the SPAN knob for a 20 mA reading.

5. Relieve all pressure, allow a few seconds for setting and adjust the ZERO knob for a 4 mA current loop reading.
6. The SPAN and ZERO controls are slightly interactive so steps 4 & 5 should be repeated a few times until readings of 4 and 20 mA are obtained consistently.
7. Remove the milliammeter from the current loop and proceed with final installation of the transmitter and receiver.

MULTIPLE UNITS WITH COMMON POWER SUPPLY

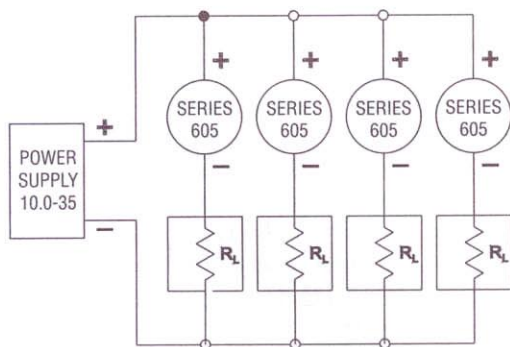


Figure D

Several Series 605 transmitters can be operated with a single power supply as depicted above in Figure D. Be careful to specify a supply with sufficient capacity. The minimum current requirement at a given voltage can be calculated by multiplying the number of units x 20 mA. In the example shown this would be 4 x 20 or 80 mA minimum.

MAINTENANCE

Upon final installation of the Series 605 Transmitter and the companion receiver, including the A-701 Digital Readout, no routine maintenance is required. A periodic check of system calibration is recommended. The Series 605 Differential Pressure Transmitter is not field repairable and should be returned, freight prepaid, to the factory if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization (RGA) number before shipping.